Original Article

Bodily communication skills and its incidence on female volleyball championship to enhance didactics

GAETANO RAIOLA, PIO ALFREDO DI TORE

Department of Human, Philosophical and Education Sciences – University of Salerno (Italy)

ABSTRACT

Raiola G, Di Tore PA. Bodily communication skills and its incidence on female volleyball championship to enhance didactics. *J. Hum. Sport Exerc.* Vol. 7, No. 2, pp. 365-375, 2012. Focus of the study is to verify the incidence of performance analysis data of bodily communication in volleyball, in order to evaluate the benefits of approving bodily communication points for a new categorization of data points. In detail, the purpose of this study is to verify if any technical skill related to the fundamental of the attack can be characterized by the bodily communication and if it can affect game results. The study result can help the coaches to consider the function of bodily communication in volleyball. The method of study combines the theoretical-argumentative approach with experimental approach of performance analysis. The survey of data is entrusted to performance analysis methodology, carried out gradually with the help of experts, coaches and analysts. The results show as this study can help the coach to train the team for improving the analyzed technical skills in different mode, creating a methodological system training to enhance the performance. **Key words**: PERFORMANCE ANALYSIS, TECHNICAL SKILL, CATEGORIZATION POINT, TEACHING METHODS, TRAINING

Corresponding author. Department of Human, Philosophical and Education Sciences, University of Salerno, Via Berenice, 11, 80126, Napoli, Italy.
E-mail: raiolagaetano@libero.it
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INTRODUCTION

"Volleyball is a sport where the use of body language is very frequent, it is a sport with very narrow game space (81 square meters per team) and actions extremely rapid and dynamic, whose technical characteristics, tactics and logistics constantly allows nonverbal communication among the players on the court" (Raiola, 2010).

Focus of the study is the application of bodily communication to volleyball. The analysis of the results of sporting performance can highlight relationships between scores and some skills attributable to bodily communication. Currently, the process of training, its organization, and teaching methodology need more knowledge on the qualitative aspects of sports performance (Schmidt & Wrisberg, 2008), including bodily communication.

Volleyball is particularly suited to the study of bodily communication for the peculiarity of very limited time available in the neuropsychological processes in the mandatory mode of ball rejecting. The tactical and technical aspects assume greater importance than quantity in volleyball.

According to Lobietti (2009) "volleyball is an open skill sport and for this reason the variability of the movement is very high. Therefore, the biomechanical studies have to follow notational analyses and qualitative descriptions of the skills".

In their study about "Volleyball coaches behavior assessment through systematic observation" Zetou et al. 2011 considered "remarkable the fact that «Tactical instructions» were the most frequently occurring behaviors".

Bodily communication has its own epistemological framework in which the message follows a process of encoding, transmission and decoding (Argyle, 1988; Hall, 1966). It establishes contacts and relationships that are developed first by data processing and after by message content evaluating.

It has, within it, an ethnic-social substrate that changes in different cultures and contexts (Meharabian, 1972). It is a dynamic flow consisting of five basic elements: context, sender, recipient, channel, code (Jakobson, 1956) and follows a logical and analogical process.

The arguments of bodily communication affect the feint, which means manifest intention of achieving a goal through the initial implementation of a plan with specific motor signs, postures, attitudes, which are later implemented in totally different pursuance. In this paper, it refers to the "tactics" decoding of bodily communication.

In particular, the decoding of signs or of bodily communication is "functional" when it refers to the same team and when communication act among players is involved or that one between the trainer and the athletes on the tactical intentions, strategies and problems of game. Decoding can be "diagnostic" when it is possible to recognize the different kind of nonverbal communications of the opposing team, through signs and elements that characterize the communication styles (Raiola, 2011a) of athletes and coaches. The third form of decoding is "tactics" when the gesture or the action simulates a game intention to solicit a reaction of the adversary who helps their own team (Raiola, 2011b). In this case, the neurophysiological and psychological basis of the movement, associated with the perception, influence the performance of each technical skill.

Furthermore, "It needs to make an appropriate framework inside university studies with contribution of Italian Federation of Volleyball that includes the basis of the functions of gestures, signs and mimicking in order to construct the competence of gestures required to become expert coach of volleyball or specialist performance analyst. In the same time, into the framework must be included theoretical and practical steps that explains how to teach and training the anticipation skills and how to address the players to utilize the anticipation skills to win the confrontation with the opponent. Finally, the framework have to educate teachers, coaches and technicians on specific theoretical, argumentative, technical, tactical and practical knowledge with ecological approach that integrates also motor and sport activities as expertise" (Raiola, 2011c).

"It is apparent that sport performance researchers should take great care in matching the particular aims of a study with the correct choice of dependent variable. Unlike clinical researchers, who need to predict the effects of interventions on the construct of `health' by examining specific symptoms of disease (e.g. blood lipids for risk of heart disease), performance researchers may sometimes forget that they can measure final outcomes (performance) directly, rather than relying solely on `symptoms' (predictors) of good performance. This advantage brings with it many important considerations, including the external validity of the sample and test, the delimitation of a worthwhile performance enhancement, the choice of descriptive or intervention research, and adequate research design and analysis" (Atkinson & Nevill, 2001).

The scientific aims of this research work is to analyze three specific skills relating the attacker role and the setter one in relationship to defenders:

a) the second ball goes to the opposite court instead of setting for attacking;
b) the attack as fast as possible in the middle of the net;
c) the off speed hit instead of power spike over the block;

according to the principles of bodily communication (Argyle, 1988), the aspects of perceptive senses (Berthoz, 2002) and the neurobiological implications (Rizzolatti & Sinigaglia, 2006) and to give a general plan for training that includes knowledge about the function of gestures, signs and mimicking, the structure and the mean of non-verbal messages and the effects of bodily communication on behaviour in order to build expressive and communicative skills of volleyball coach of the signs and the gesticulation in communication processes and in particular the "pragmatic" side of communication and the effects that it has on behaviour (Watzlawick et al., 1967).

"It is vital that the reliability of a data gathering system is demonstrated clearly and in a way that is compatible with the intended analyses of the data. The data must be tested in the same way and to the same depth in which they will be processed in the subsequent analyses" (Hugues, 2004).

The survey of data is entrusted to performance analysis methodology, carried out gradually with the help of experts, coaches and analysts.

The coach of the selected team trains the performance analyst how to analyze three fast skills and to whom exactly to attribute the outcomes between the attacker of his own team and defender of the opposite team applying the different performance indicators. The analysis was carried out:

• In real time, that is the recruitment of data is directly by hand notation when the analyst observes the match;

• In differed time, through the use of match analysis dedicated video- software (Data Project, Dartfish, Elite Focus).

MATERIAL AND METHODS

The method of study combines the theoretical-argumentative approach with experimental approach of performance analysis. It is an integrated approach to aim the some aspects of ecological phenomenon of volleyball sports game.

"Basic research is designed to corroborate or discount theories of the underlying mechanisms of a particular phenomenon. Basic researchers may ask binary-type questions, such as `Does variable x explain variable y, when all other variables are controlled?´ Such questions are usually part of the process involved in modeling physiological or psychological mechanisms. Theory-driven research questions like these can be addressed by classical hypothetical-deductive methods, the null hypothesis testing procedure and a sound experimental design, as Chow (1996) has discussed at length. In principle, these procedures should allow the researcher to be reasonably certain that, if all variables other than x have been controlled in an experiment, and the observed changes in y cannot be attributed to chance influences, then x must be the cause of y (Atkinson & Nevill, 2001).

The survey of data is entrusted to performance analysis methodology, carried out gradually with the help of experts, coaches and analysts.

Technical skills identified are:

a) The second ball goes to the opposite court instead of setting for attacking.
b) The attack as fast as possible in the middle of the net.
c) The off speed hit instead of power spike over the block.

The analysis is carried out during the match, always in contrast to the opponent wall, according to notational analysis techniques. Hughes (2006) and Franks (1983) suggest that notational analysis is primarily concerned with the analysis of movement, technical and tactical evaluation and statistical compilation. Therefore, the notational analysis is a technique to analyze different aspects of performance through a process which involves a permanent registration of the events. The performance analysis tools are: annotations in real time and also deferred through the use of video-software by experts, coaches and analysts specifically trained. The evaluation of the data is provided by a team of analyst, by the coach, and in some cases by the performer.

The activities were carried out by a research group formed within the trainers, breeders and performance analysts of the volleyball centre of the Campania Regional Qualifying Committee of the Italian Volleyball Federation since 2008.

RESULTS

This study was made on the basis of the results and discussion of an earlier pilot study. The type of decoding "tactics" refers to three technical skills already identified and investigated in the pilot study:

a) The second ball goes to the opposite court instead of setting for attacking.
b) The attack as fast as possible in the middle of the net.
c) The off speed hit instead of power spike over the block.

As the other study similar of this one (Raiola, 2011c), the datum of the pilot study shows an appreciable percentage points attributed to the impact of three of the fundamental technical skills of the attack which could be attributed to bodily communication. The sample selection of competitions analyzed in the pilot study, being limited and accidental, is not representative and does not help to gain a real knowledge of the phenomenon. Therefore, the study showed a sample of competitions consisting of an entire season's team racing in the Centre Ester Napoli 2009-10 militant women in the C series made of 26 competitions, after which the team has achieved promotion to the higher division.

Collecting good data takes time (Locke et al., 2010), and quick interviews or short observations are unlikely to help gaining more understanding. “If you are doing qualitative research, you must plan to be in the environment for enough time to collect good data and understand the nuance of what is occurring” (Thomas, Nelson, Silverman, & Silverman, 2010).

The sample allows the study of the phenomenon limited to the group team for a reasonable period. The aim is to identify the amount of points for each of the identified technical skills of the attack and analyze the relationship with other types of attribution of the score. The method of recruitment is given by the analyst of the team by watching videos with the software Data Project.

Results are:

Attack as fast as possible in the middle of the net:	196
Second ball goes to the opposite court instead of setting for attacking:	104
Off speed hit instead of power spike over the block:	71

The results by type of point are:

Bodily Communication points:	372
Skills Points:	957
Opponent Team Error Points:	263
Various Points:	360

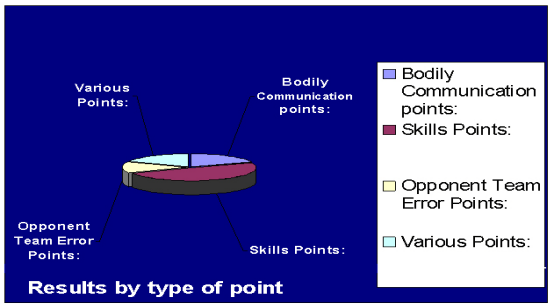

Figure1. *Results by type of point.*

Table 1. *Selected technical skills data table.*

MATCHES	**off speed hit instead of power spike over the block**	**second ball goes to the opposite court instead of setting for attacking**	**attack as fast as possible in the middle of the net**
1	5	4	9
2	5	3	9
3	4	3	8
4	4	2	7
5	3	3	7
6	3	2	8
7	2	4	9
8	4	4	8
9	4	3	7
10	5	2	6
11	4	3	7
12	3	2	6
13	4	3	7
14	3	3	7
15	3	2	9
16	4	3	8
17	4	4	7
18	4	2	7
19	3	4	8
20	5	2	7
21	4	2	8
22	6	3	6
23	4	2	7
24	5	3	8
25	6	1	7
26	3	2	9
Total	104	71	196
Average	**4**	**2.7**	**7.5**
Minimum	**2**	**1**	**6**
Maximum	**6**	**4**	**9**
Standard deviation	**1**	**0.8**	**0.9**

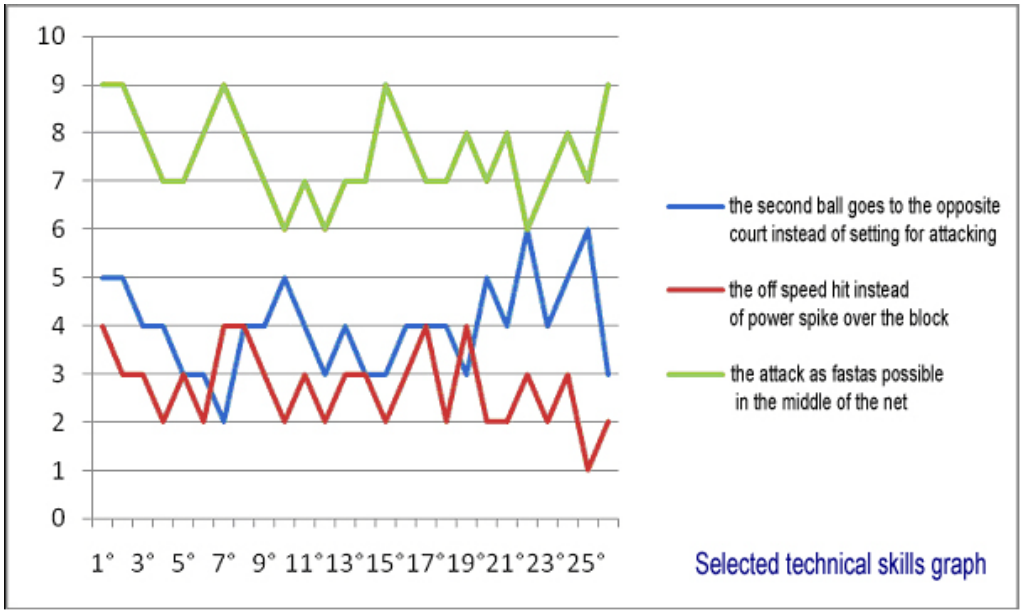

Figure 1. *Patterns of play.*

Table 2. *Aggregated data by type of point.*

Matches	Bodily Communication Points	Skills Points	Opponent team errors points	Various Points
1	18	40	8	11
2	17	37	9	12
3	15	36	7	17
4	13	33	8	21
5	13	38	10	14
6	13	34	11	17
7	15	32	13	15
8	16	35	11	13
9	14	39	12	10
10	13	37	14	11
11	14	38	11	12
12	11	35	12	17
13	14	34	13	14
14	13	37	10	15
15	14	33	11	17

Matches	Bodily Communication Points	Skills Points	Opponent team errors points	Various Points
16	16	37	11	11
17	15	39	9	12
18	13	40	7	15
19	15	38	9	13
20	14	39	8	14
21	14	38	12	11
22	15	37	9	14
23	13	40	8	14
24	16	37	9	13
25	14	39	10	12
26	14	35	11	15
Total	372	957	263	360
Average	**14.3**	**36.8**	**10.1**	**13.8**
Minimum	**11**	**32**	**7**	**10**
Maximum	**18**	**40**	**14**	**21**
Standard deviation	**1.5**	**2.3**	**1.9**	**2.5**

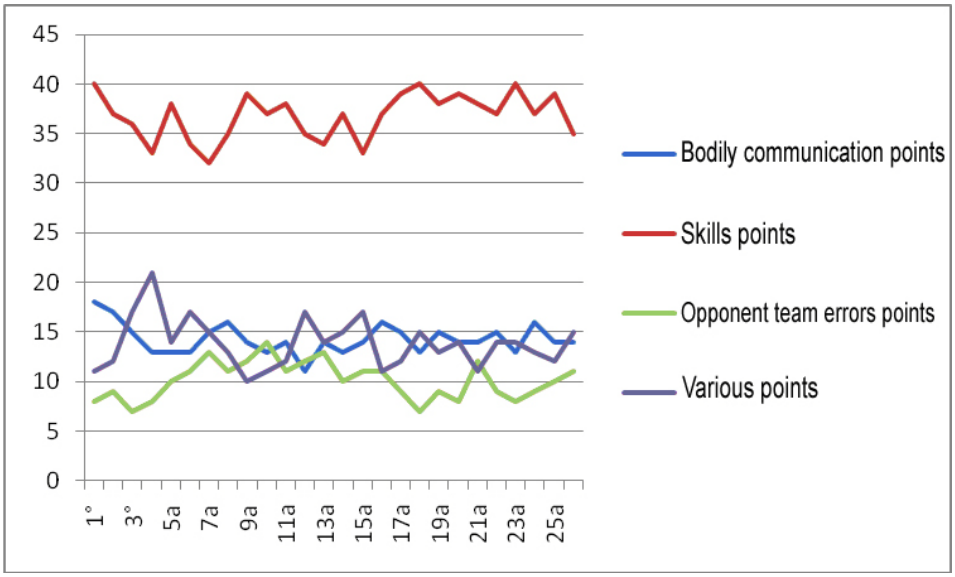

Figure 2. *Bodily communication points, skill, errors and various points.*

The three skills are always present in each of the 26 matches. It shows a similar pattern among the three technical skills during the competitions. The sum of the three skill points is encoded in bodily communication, in a range between 11 and 19 points per game. These points affect the outcome for each match. The points awarded to the fundamentals, except those of bodily communication, are more than double of other types of points. The number of points, points of bodily communication and points of opponents' mistakes has similar patterns and therefore are of similar weight in the interpretation of events. Beyond the representativeness of the sample, there is greater accuracy due to the cooperation in recruiting analyst / coach and a greater attention to the phenomenon of bodily communication in volleyball. The interpretation of the data was performed on each match in order to better identify the weight on the score of the competition by adding the scores of each set. Probably, however, this process does not correspond to the actual reading of the phenomenon because it is the sum of the individual points of the set that determines the final outcome of the competition. This classification of scores conducted at a bodily communication valence category score that can be useful to read the competition in a different way from the traditional one.

DISCUSSION AND CONCLUSIONS

The overall study has highlighted that the results attributed to Bodily Communication have an evident weight on the final score and have similar patterns during the matches. These results can be considered, therefore, in a class by itself as the points assigned to each skill. They have their own characteristics and accidents. The data of the 3 skills can be approved for a new categorization of data points.

The bodily communication in the analysis of qualitative performance in volleyball is dedicated to all aspects of individual tactics, when it is extemporaneous, or tactics of team if it is analyzed, designed, programmed and then trained in its development.

It can enable greater efficiency in the gaming action in a perspective of optimization of attacking actions. Studies on the tactical aspects of individual and team are still rare.

"Not surprisingly, the majority of published notational analysis work in sports derives from academics with an interest in soccer, basketball or volleyball and they are not necessarily involved in the coaching process. Many volleyball coaches do not agree how to attribute the outcome points to the single volleyball fundamentals for all action. That happens when the decision of the attacker attribution and the opposite defender is borderline. Often, the inference of the outcomes in these actions is due to the feint and, generally, by the use of bodily communication in fast motor skills" (Raiola, 2010).

It may be useful for the analysis of the performance of the athlete to identify, explain, argue and ultimately justify the specific contribution of bodily communication on the determination of the result.

The exact evaluation of these outcomes, as such as the attribution of the point, could help the coach to analyze the performance of his own athletes and so to train them in the better way. Thus, teaching methods has to been in same way according to main scientific paradigm on didactics.

It may be useful to provide an educational course for technicians and coaches about the following subjects:

1. Neurobiological knowledge on the mechanisms of regulation of the various types and ways of imitation, learning, and gestural communication according to the research on mirror neurons (Rizzolatti & Sinigaglia, 2006; Iacoboni, 2008).

2. Knowledge of the mechanisms of perception and on the sense of movement or kinaesthesia which makes possible of simulations and anticipations of motor actions (Berthoz, 1999; Latash, 2008).

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